THE MAC Flyer

JUNE 1983

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THE MAC Flyer

For Greater Safety in MAC Air Operations

JUNE 1983 MACRP 127-5 VOL XXX NO.6

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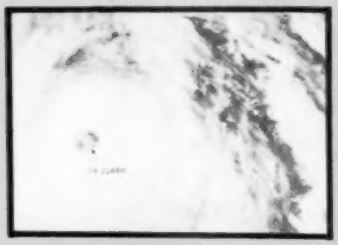

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Artist's depiction of C-5 in European 1 camouflage.

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C-5
The first 15 years

Photos courtesy of Lockheed-Georgia and USAF.

by Major James M. Lee
Supervising Editor

The tension on that sunny Georgia morning back in 1968 was unbearable. Years of development, design, manufacturing and testing were on the line as the gray-and-white transport taxied slowly to the west end of the Dobbins AFB runway. Then, with a deafening scream, the four TF-39 engines were advanced to takeoff power and the imposing airlifter began its initial takeoff roll. After rolling only 4,500 feet, the nose lifted and the world's largest aircraft, the C-5A Galaxy, was airborne. The date—30 June 1968. In the 15 years since that maiden flight, the C-5 has weathered a storm of controversy and has become an irreplaceable part of our nation's airlift force. As we applaud the C-5 on its first 15 years of service, let's review some of its most significant moments in airlift history.

The first operational Galaxy entered active Air Force service on 17 December 1969, when General Jack J. Catton, then-commander of MAC, took formal delivery of C-5 tail number 70170. Following acceptance, General Catton and his crew flew the aircraft to Altus AFB, Oklahoma, where it was used to train C-5 aircrews. Additional C-5s went to Altus, prior to deliveries to squadrons at Charleston AFB, South Carolina,

Above left—Somewhere over Georgia, the C-5A on its first flight accompanied by a Lockheed T-33 chase plane.

Above—The Army's new main battle tank, the M-1 Abrams, is unloaded after its first flight. The C-5 is the only airlifter capable of hauling the 59-ton tank, two at a time.

Carolina, and Travis AFB, California. But the giant airplanes began proving their worth well before the last one was delivered to the Air Force in 1973.

Some of the Galaxy's most impressive missions have included: an airlift to Da Nang, Vietnam, in 1972; relief missions to Nicaragua in 1972; the Israeli "Nickle Grass" airlift in 1973; and the movement of a 40-ton super-conducting magnet from Chicago to Moscow in 1977. (See *TMF* Jan-Feb 1978).

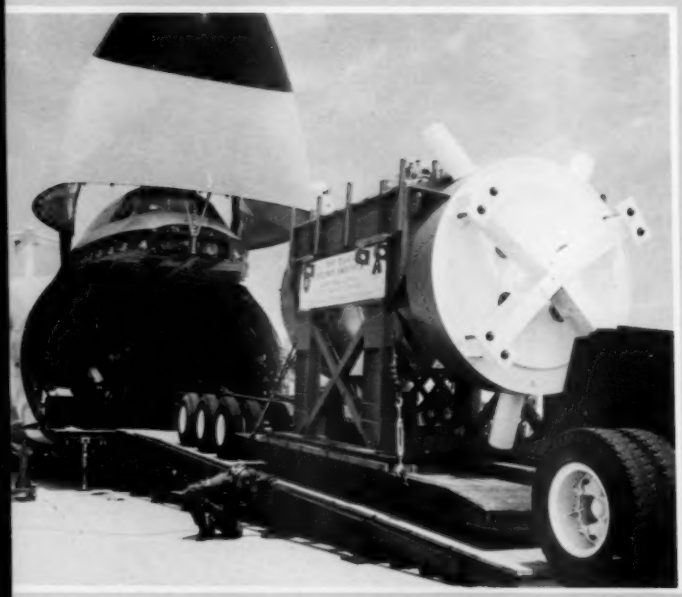
In 1972 the C-5 was used to move equipment, tanks and helicopters to the besieged airbase at Da Nang, Vietnam. In the course of only 10 missions, Galaxy crews airlifted over 1,650,000 pounds of cargo, averaging only 32 minutes from touchdown to takeoff at the Southeast Asia base. That the missions involved a 14,000 mile round trip attested to the intercontinental airlift capability of the giant aircraft.

The capabilities of the C-5 were also effectively used following the massive destruction caused by the 1972 earthquakes in Nicaragua. Responding to requests for aid, C-5 crews airlifted a 100-bed mobile hospital, water purification units and communications equipment to the Central American country.

But it was in 1973, during the Yom Kippur War, that the true capabilities of the Galaxies were demonstrated in a contingency operation. Flying from the United States to Lajes AB in the Azores, then on to airports in Israel, C-5s flew one of the largest long-distance aerial resupply missions in history. MAC C-5 crews were credited with airlifting over 21,129,000 pounds of equipment and supplies during the operation which lasted from 14 October to 14 November and involved 145 C-5 missions.

During June 1977, the C-5 flew one of its more highly publicized missions when a 40-ton super-conducting magnet was airlifted from Chicago to Moscow. The Galaxy and its crew completed this high-visibility mission, safely and on-time. The mission took approximately 12 hours, required two aerial refuelings and involved a total cargo load of 169,798 pounds.

The C-5 has undergone numerous changes since that first flight in 1968, with improvements to many systems on the aircraft. These include: addition of a triple-INS, installation of the ALDCS (Active Lift Distribution Control Subsystem), removal of the K-band radar, updating communication



40-Ton Magnet—With its destination the Soviet Union, a superconducting magnet and its flatbed truck are loaded for the record breaking Chicago-to-Moscow flight.

Snow Games—off-runway tests like this one proved the C-5 could operate on just about any kind of surface.

and navigation radios and modification and improvement of other systems.

A long-awaited improvement in the Galaxy took place during 1980 when the first aircraft fitted with new state-of-the-art aluminum-alloy wings made its initial test flight. Following extensive flight and ground testing, a contract was let to rewing all remaining C-5s. The first production aircraft rewinged under this contract completed its test flights earlier this year. Air Force and Lockheed Aircraft Company structural engineers estimate the new wings will enable the C-5 to perform its mission well into the twenty first century.

New Wings—New state-of-the-art high strength wings for the C-5 show their mettle on their first flight, 14 August 1980. The new wings will extend the useful of life of the C-5 well into the 21st century.

Recognizing the need for increased outsized airlift capability, the Department of Defense and the Air Force recently signed contracts with Lockheed-Georgia to reopen the C-5 production line. The contract calls for approximately 50 C-5B models to be built, with first delivery to come in December of 1985. The "B" models will incorporate improvements already made to the "A" models and will have further changes and improvements as well.

In the 15 years since that first flight, the C-5 Galaxy has proved itself a worthy and capable airlifter. To those who built, to those who support and maintain, and to those who fly the world's largest airlifter—congratulations on the first 15 years from the staff of *TMF*. ★

Drive On, Drive Off—An Army 155mm self-propelled howitzer demonstrates a main feature of the Galaxy.

Excellence in Airmanship

Captain Walker and crew, 16th Tactical Airlift Training Squadron, Little Rock AFB, Arkansas, were on a routine Phase I C-130 training sortie bound for Jackson, Mississippi, when they experienced a potentially catastrophic series of inflight emergencies. This was the first training flight for the two student copilots and the third mission for the student flight engineer.

Leveling at their cruise altitude of FL 190 and cleared direct to the Greenwood, Mississippi VOR, to avoid an area of thunderstorms, the C-130E crew began encountering light turbulence and icing while in the clouds. Captain Walker decided to slow to 177 knots, the turbulent air penetration airspeed, and after reaching that airspeed, engaged the autopilot.

Shortly afterwards, the crew smelled electrical-fire fumes in the cockpit and Captain Walker directed the crew to don oxygen masks. When he turned to investigate heavier smoke at the navigator's station, both the navigator and pilot radar scopes lit up brightly and then went blank. Captain Walker immediately directed the instructor flight engineer to shut down the radar and open the appropriate circuit breakers.

Shortly after these actions were completed and the smoke began to dissipate, Captain Walker noted the airspeed had decreased to 150 knots and applied full power, verifying this via the engine instruments. The airspeed, however, remained at 150 knots. He confirmed, with the flight engineer, that the pitot heat was on, and realizing the potential hazards of continuing with pitot/static or electrical problems, directed the student copilot to coordinate an immediate return to Little Rock AFB.

When the clearance to return was received, Captain Walker attempted to execute a left turn using the autopilot, but the aircraft wouldn't turn. He then

Captain Donald L. Walker, IAC, 16th TATS

disconnected the autopilot and attempted to turn manually. When the controls would not move, he rechecked the autopilot off, pushed the autopilot emergency release on the yoke and again attempted a left turn. This time the yoke moved, but only with extreme difficulty.

Ultimately, Captain Walker was able to gain full scale deflection of the yoke to the left, but the aircraft still wouldn't turn. He centered the flight controls and verified both ADIs indicated 0° bank and level flight, both airspeed indicators showed 150 knots and compasses indicated a heading of 090°.

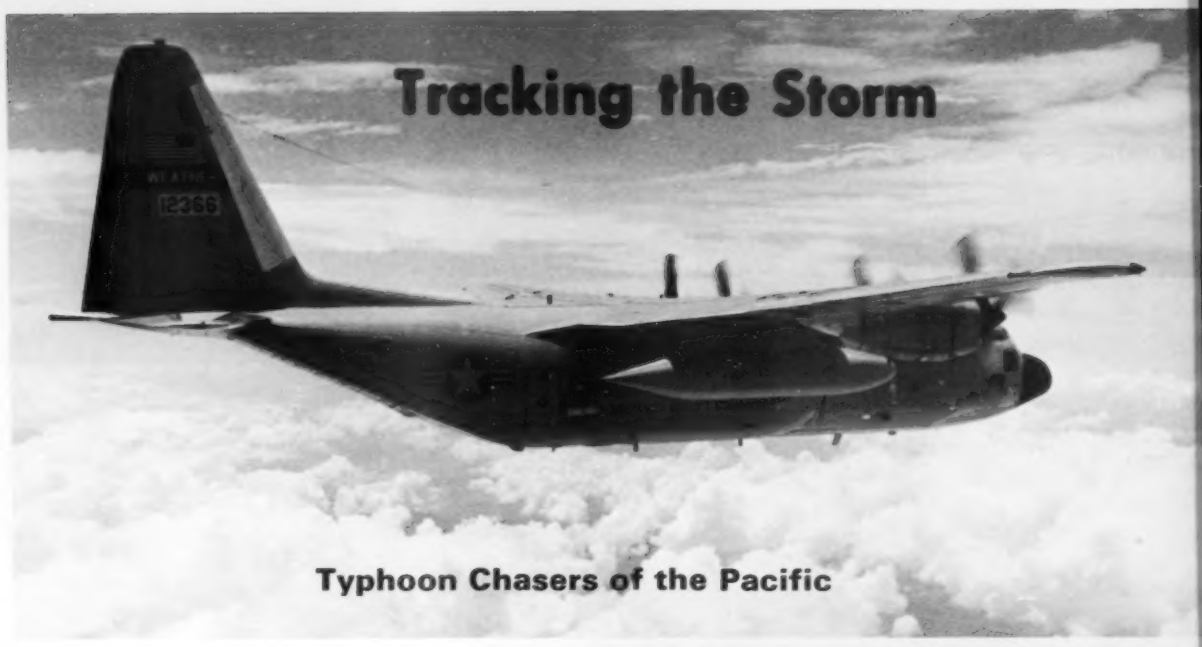
Abruptly, and with no movement of the flight controls by the crew, the aircraft entered a 45° left bank and started to descend at a rate in excess of 3,000 feet per minute. Captain Walker and the student copilot tried desperately to roll the plunging C-130 to the right and pull the nose up, but they were unable to move the flight controls. Suspecting an electrical power source malfunction was causing autopilot lockup, the instructor flight engineer turned on the air turbine motor and generator, and brought them on line at Captain Walker's direction. But this attempt at fixing the problem proved futile and the crew was still unable to overcome the uncommanded flight control deflection.

Suddenly, due to some unknown corrective action, Captain Walker regained control of the aircraft and leveled off at 13,000 feet, heading 270° and at an airspeed of 198 knots, still in IMC. The entire sequence of events from the first uncommanded input until aircraft control was regained took only 2 minutes. Captain Walker then decided to descend to VMC conditions and performed a controllability check, noting the only problem to be extremely stiff ailerons.

The remainder of the return to Little Rock AFB was routine until the aircraft reached a 3-mile ILS final. At that point the rudder appeared to freeze in the neutral position and could not be moved even by the combined efforts of Captain Walker and the student copilot. Electing to continue the approach in light of the previous problems, Captain Walker abandoned attempts to move the rudder and completed the approach and landing with judicious use of ailerons and differential power. (At last report, the cause of this incident is still under investigation.)

Captain Walker's extraordinary flying skill and disciplined and responsive handling of multiple, unexplained inflight emergencies undoubtedly saved the lives of six crewmembers and prevented the loss of a valuable Air Force aircraft. *TMF* salutes this crew's "Excellence in Airmanship."

Tracking the Storm



Typhoon Chasers of the Pacific

by Captain Gale E. Clouse, Jr.
Associate Editor

Odessa, her path as different as her name, was unusual. At one time or another, she threatened Guam, Kwajalein, Wake, and any number of islands in the Caroline and Marshall Island groups. Inexplicably, she drifted northeastward initially, then, as if triggered by the change of months, turned northwest, intensified into a typhoon, then dissipated.

In a visit and training flight with the 54th Weather Reconnaissance Squadron (WRS) at Andersen AFB, Guam, I was to learn about Typhoon Odessa and much more. It was a "real education," concerning typhoons, the associated typhoon warnings, the 54th WRS, and the MAC men and women who fly into Pacific storms. As professional and courageous a group of people as you'd ever meet, they are indeed proud to be called "Typhoon Chasers."

Cyclones and Typhoons

The tropical cyclone, a severe storm of tropical origin, is one of the most destructive forces on earth. Called typhoons, or hurricanes east of the International Date Line, severe storms of this type are known and feared worldwide. They form in tropical waters in both hemispheres and generally move westward, then often turn toward the poles.

In the western Pacific above the equator,

Above Left—A WC-130E of the 54th WRS, Andersen AFB, Guam.

Above—Typhoon Clara, photographed from a weather satellite on 19 September 1981, generated winds of 115 knots!

typhoons form around low pressure centers and can develop into full-blown killers within 48 hours. Stages of development, in ascending order of intensity, include: (a) tropical depressions, with surface winds of 33 knots or less; (b) tropical storms, with surface winds 34-63 knots; (c) typhoons, with surface winds 64-129 knots; and (d) super typhoons, with sustained surface winds of 130 knots or *greater*. Only a few storms ever reach the super typhoon stage.

Typhoon Warning—the JTWC

High winds, torrential flood-causing rains and storm surge (storm-induced abnormal tides) from typhoons threaten life and property in populated coastal areas as well as ships at sea. To protect U.S. resources in the Pacific, the Joint Typhoon Warning Center (JTWC) was formed in 1959 at Nimitz Hill, Guam. A joint Air Force/Navy activity, the JTWC today issues tropical cyclone warnings for the Pacific Command area west of 180° longitude to the east coast of Africa. Using computer products and conventional data, as well as inputs from aircraft, satellites and a radar network, the forecasters at the JTWC attempt to predict where a storm will form, how it will track, and how strong it will become. Advisories, alerts and warnings are then issued in response to storm development. At the first sighting of a potential typhoon, the 54th WRS "Typhoon Chasers" will usually be called into action.

Typhoon Chasing

The mission of the 54 WRS is simply to provide aerial weather reconnaissance in the Pacific area. The men and women of the 54th are always on the watch for Pacific storms. Their area of responsibility is rather large—a 7 million square mile area bounded on the east by the International Date Line, on the west by the Bay of Bengal, on the south by the equator and on the north by the Arctic Circle.

The 54 WRS comes under the newly-created 23d Air Force and is a part of the Aerospace Rescue and Recovery Service (ARRS). The squadron's parent wing is the 41st Rescue and Weather Reconnaissance Wing located at McClellan AFB, California. The 54 WRS commander serves as the Tropical Cyclone Aircraft Reconnaissance Coordinator (TCARC) for the Pacific Command. As the TCARC, the commander receives storm taskings directly from the JTWC and directs WC-130 flights to find and fix the locations of typhoons and tropical storms.

Presently equipped with six WC-130s, the 54 WRS is augmented by three additional WC-130s and crews from the 53 WRS at Keesler AFB, Mississippi, from July through mid-November, the peak storm season. In 1982, the two units completed over 300 "fixes" on 29 Pacific storms and typhoons.

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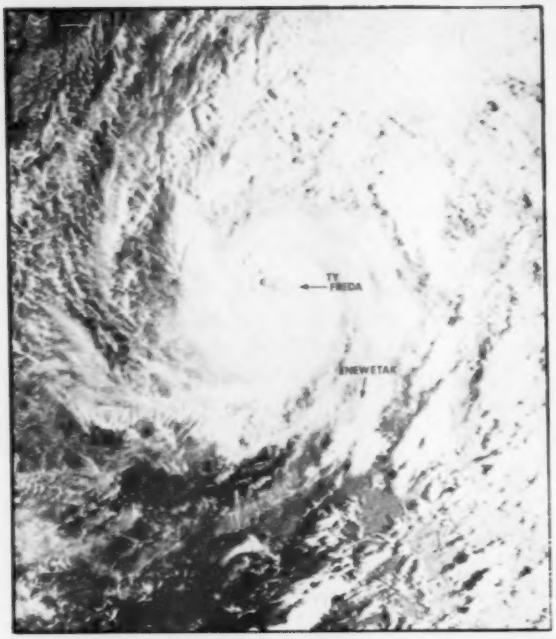

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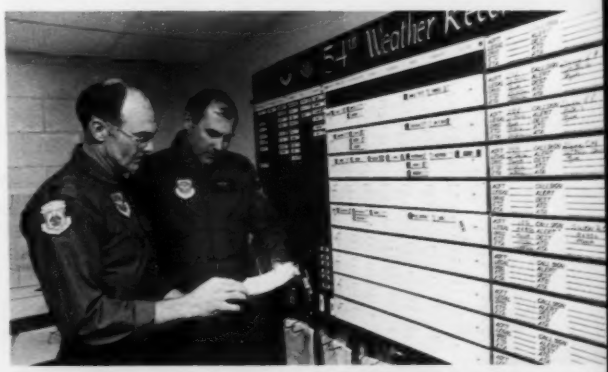
Aerial Reconnaissance Weather Officers

Assigned to Detachment 4, Headquarters Air Weather Service, Aerial Reconnaissance Weather Officers (ARWOs) and dropsonde



Upper left—Typhoon Freda, 390 nm southwest of Wake Island, 14 March 1981. Winds at this time were 80 knots. Top—Lt Col Skip Lee, 54 WRS commander, discusses the mission schedule with Lt Col Larry Bagley, left, ops officer.
Above—Philippine Navy destroyer *Datu Kalantigaw* after being forced aground by Typhoon Clara. (USN photo by PH2 P.B. Soutar)

operators fly with the 54 WRS as an integral part of each crew. Captain Terry Laing, a flight examiner ARWO, was on our flight giving training to an ARWO instructor trainee, Captain Bil Greg. Bil, in turn, was instructing an ARWO student, Captain Thomas Ling.

"ARWOs fly as the technical mission director and are responsible for the collection of all meterological data on storm missions," Laing explained. "Our console is located right on the WC-130 flight deck. We're all qualified forecasters." He continued, "All ARWOs have had experience on the ground as weather forecasters before being trained as crewmembers. When we're flying a storm mission, we send the weather data we've collected to the JTWC as quickly as possible. They base their cyclone warnings on our information. We also phone patch via HF radio the Andersen AFB base weather station. Andersen weather, in turn, transmits our data directly to other Air Force units via the Air Force automatic weather network (AWN) for worldwide dissemination."

The ARWOs collect pertinent weather data from the storm using weather instrumentation and personal observation. A dropsonde (a non-recoverable, electronic tubular sensing device) is released and provides temperature, humidity and the minimum sea level pressure from the storm environment. Weather personnel at JTWC are also interested in flight level and surface winds and horizontal wind distribution. The ARWO reads the way the waves are breaking to obtain the surface wind direction and velocity. According to Captain Laing, "JTWC is really interested in the typhoon's surface wind." Winds become especially critical as a storm tracks toward populated land areas.

Captain Laing continued, "Many people have a misconception of what it's like to fly into a tropical storm. They think the WC-130 is flailing about wildly during every storm penetration, and that's not true. As a general rule, turbulence is not all that bad. In penetrating the wall cloud, which is the most dynamic part of the storm located right next to the eye, you may get moderate turbulence. We did get some severe turbulence last December in Typhoon Pamela, however. I wasn't strapped in and ended up 'hanging on' for a couple of minutes."

Captain Laing also explained the procedure for flying through the storm. "We fly a constant pressure altitude of 700 mb which equates to 9,880 feet. As we fly into the storm, the pressure is dropping and you are descending. I've been as low as 5,500 feet absolute altitude in a strong typhoon."

Safety

While intentionally flying through severe weather can be hazardous, the 54 WRS performs its job safely. They just don't fly up to a storm, close their eyes, and press right through it. Lieutenant Colonel Skip Lee, the 54 WRS commander explained how his crews do it.

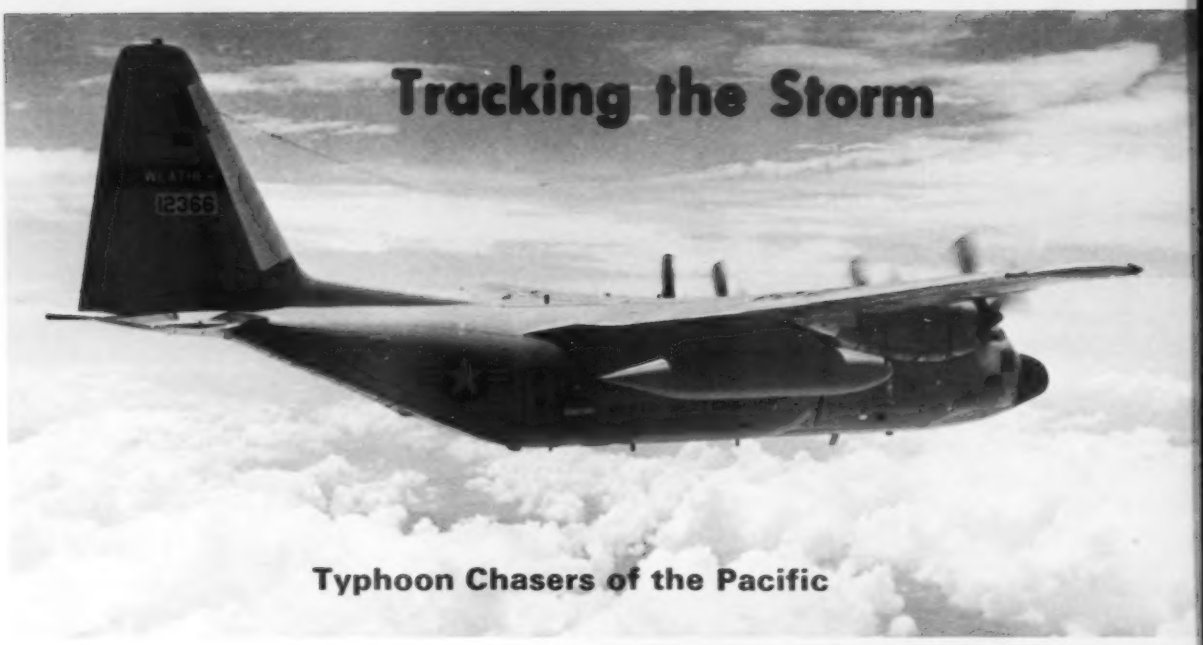
"We know what we're after. We know roughly how the storm is organized and where the bad weather is likely to be. We know which quadrant of the storm will give us the worst ride and which is likely to be the softest. We won't penetrate the storm if we think there's going to be severe turbulence."

The 54th WRS's flying safety record shows the squadron takes safety seriously. They haven't had a chargeable mishap in 20 years, and this year their squadron safety officer, Captain Jim Routt, was named the 1982 MAC Safety Officer of the Year (Additional Duty). (See Mar 83 *TMF*—Ed.)

Colonel Lee stresses both standardization and training as complimentary to making the safety program work. He says the keys to a good safety program are, "knowing your job, having good crew coordination and maintaining a tough, demanding standardization program." He stressed the importance of each crewmember knowing procedures and systems and being mentally prepared for any possible problems. And despite a constant rotation of crewmembers due to PCS, Colonel Lee maintains both excellence and continuity through the 54 WRS's excellent safety and standardization programs.

Conclusion

The record of safe flying by the 54th and 53d WRS crews is impressive. As they go about the business of tracking Pacific storms this summer, we at *TMF* wish them good hunting and continued safe flying!



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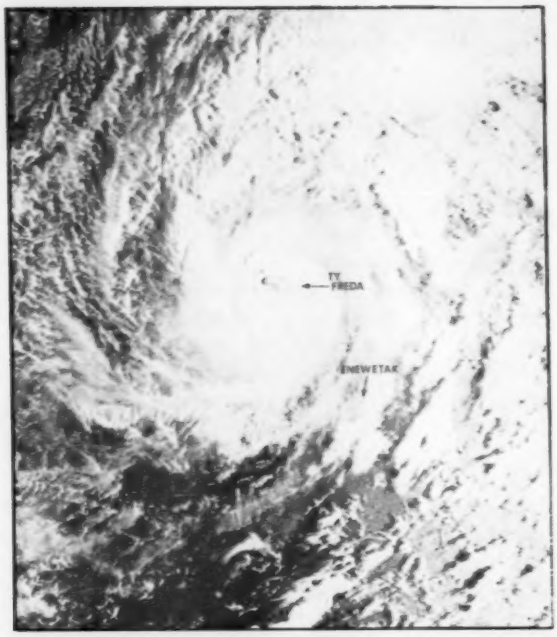

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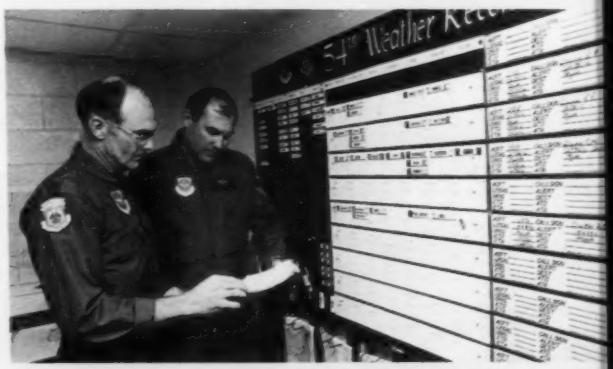
Assigned to Detachment 4, Headquarters Air Weather Service, Aerial Reconnaissance Weather Officers (ARWOs) and dropsonde



Upper left—Typhoon Freda, 390 nm southwest of Wake Island, 14 March 1981. Winds at this time were 80 knots. Top—Lt Col Skip Lee, 54 WRS commander, discusses the mission schedule with Lt Col Larry Bagley, left, ops officer.
Above—Philippine Navy destroyer *Datu Kalantigaw* after being forced aground by Typhoon Clara. (USN photo by PH2 P.B. Soutar)

operators fly with the 54 WRS as an integral part of each crew. Captain Terry Laing, a flight examiner ARWO, was on our flight giving training to an ARWO instructor trainee, Captain Bil Greg. Bil, in turn, was instructing an ARWO student, Captain Thomas Ling.

"ARWOs fly as the technical mission director and are responsible for the collection of all meterological data on storm missions," Laing explained. "Our console is located right on the WC-130 flight deck. We're all qualified forecasters." He continued, "All ARWOs have had experience on the ground as weather forecasters before being trained as crewmembers. When we're flying a storm mission, we send the weather data we've collected to the JTWC as quickly as possible. They base their cyclone warnings on our information. We also phone patch via HF radio the Andersen AFB base weather station. Andersen weather, in turn, transmits our data directly to other Air Force units via the Air Force automatic weather network (AWN) for worldwide dissemination."

The ARWOs collect pertinent weather data from the storm using weather instrumentation and personal observation. A dropsonde (a non-recoverable, electronic tubular sensing device) is released and provides temperature, humidity and the minimum sea level pressure from the storm environment. Weather personnel at JTWC are also interested in flight level and surface winds and horizontal wind distribution. The ARWO reads the way the waves are breaking to obtain the surface wind direction and velocity. According to Captain Laing, "JTWC is really interested in the typhoon's surface wind." Winds become especially critical as a storm tracks toward populated land areas.

Captain Laing continued, "Many people have a misconception of what it's like to fly into a tropical storm. They think the WC-130 is flailing about wildly during every storm penetration, and that's not true. As a general rule, turbulence is not all that bad. In penetrating the wall cloud, which is the most dynamic part of the storm located right next to the eye, you may get moderate turbulence. We did get some severe turbulence last December in Typhoon Pamela, however. I wasn't strapped in and ended up 'hanging on' for a couple of minutes."

Captain Laing also explained the procedure for flying through the storm. "We fly a constant pressure altitude of 700 mb which equates to 9,880 feet. As we fly into the storm, the pressure is dropping and you are descending. I've been as low as 5,500 feet absolute altitude in a strong typhoon."

Safety

While intentionally flying through severe weather can be hazardous, the 54 WRS performs its job safely. They just don't fly up to a storm, close their eyes, and press right through it. Lieutenant Colonel Skip Lee, the 54 WRS commander explained how his crews do it.

"We know what we're after. We know roughly how the storm is organized and where the bad weather is likely to be. We know which quadrant of the storm will give us the worst ride and which is likely to be the softest. We won't penetrate the storm if we think there's going to be severe turbulence."

The 54th WRS's flying safety record shows the squadron takes safety seriously. They haven't had a chargeable mishap in 20 years, and this year their squadron safety officer, Captain Jim Routt, was named the 1982 MAC Safety Officer of the Year (Additional Duty). (See Mar 83 *TMF*—Ed.)

Colonel Lee stresses both standardization and training as complimentary to making the safety program work. He says the keys to a good safety program are, "knowing your job, having good crew coordination and maintaining a tough, demanding standardization program." He stressed the importance of each crewmember knowing procedures and systems and being mentally prepared for any possible problems. And despite a constant rotation of crewmembers due to PCS, Colonel Lee maintains both excellence and continuity through the 54 WRS's excellent safety and standardization programs.

Conclusion

The record of safe flying by the 54th and 53d WRS crews is impressive. As they go about the business of tracking Pacific storms this summer, we at *TMF* wish them good hunting and continued safe flying! ✈

Flying-Hour Milestones

10,000

Col Robert G. McCoy, 928 TAG/CC
Lt Col Johnny F. .McDaniel, 41 MAS
Lt Col Charles W. Zawadzki, 512 MAW
CMSgt James D. Anderson, 18 MAS
SMSgt James A. Curfman, 4 MAS
MSgt Ronald L. Richardson, 4 MAS

5,000

Lt Col Edward W. Avent, III , 41 TAS
Lt Col Thomas G. Collins, 86 MAS
Lt Col Fred E. Sparks, 41 RWRW
Lt Col Victor R. Thomas, 772 TAS
Maj Howard C. Abner, 40 TAS
Maj George R. Banton, 41 TAS
Maj Frederick E. Barton, 55 AAS
Maj Wayne R. Bevan, 312 MAS
Maj Samuel K. Byers, 40 TAS
Maj James F. Cunningham, 312 MAS
Maj Dale Grigg, 1 MAS
Maj Robert D. Hayden, 16 TATS
Maj William D. Jenkins, 312 MAS
Maj Leon A. Kraut, Det 1, 89 MAW
Maj James W. McKinney, 105 TAG
Maj Joseph Ponce, 312 MAS
Maj Daniel O. Pyne, 41 TAS
Maj Stephan J. Stubits, 143 TAG
Maj Victor R. Trovy, 16 TATS
Maj Gregory P. Ulrich, 1 MAS
Maj Dudley F. Waters, 41 MAS
Capt Daniel F. Callahan, III , 105 TAS
Capt Dennis Crago, 907 TAG
Capt Robert G. Hvisc, 3 MAS
Capt Timothy J. Quinn, 1 MAS
Capt Scott S. Withers, 86 MAS
SMSgt Dale W. Davis, 907 TAG
SMSgt David L. Dorsey, 167 TAS
SMSgt Jerrold S. Eignor, 18 MAS
SMSgt Kenneth P. Hannegan, 1 MAS
SMSgt Gerald P. Land, 512 MAW
SMSgt Rodney Martin, 18 MAS
SMSgt Carl E. Mass, 20 MAS
SMSgt Louis C. McVey, 41 TAS
SMSgt Jack G. Romero, 907 TAG
SMSgt Robert G. Smith, Jr., 1 MAS
MSgt John H. Anthony, 312 MAS
MSgt Herbert A. Hedgepath, 105 TAS
MSgt Charles M. Hill, 312 MAS
MSgt Norman E. Key, 40 TAS
MSgt Thomas R. Mietus, 1 MAS
MSgt Paul E. Miller, 18 MAS
MSgt Gale B. Mutum, 1 MAS
MSgt Francisco Oropeza, 1 MAS
MSgt Raymond J. Parsons, 700 TAS
MSgt George W. Singleton, 41 MAS
MSgt Terry O. Stapp, 53 MAS
MSgt John R. Stauffer, Jr., 41 MAS
MSgt Charles E. Tipper, 105 TAS
MSgt Jimmy W. Watkins, 700 TAS
TSgt Edward J. Calhoun, Det 1, 89 MAW
TSgt Michael Lynn, 1 MAS
TSgt James L. Stewart, III , 20 MAS
SSgt Raleigh Bramlette, 41 TAS
SSgt Shelby D. Tipton, 16 TATS
SSgt Lawrence L. Zilka, 4 MAS

2,500

Maj Paul L. Jacobs, Det 11, 39 ARRW
SMSgt James F. Spears, 33 ARRS

(Ranks and units at time of awards. See MACR 900-3 for details on how to apply for your own milestone award.)

Beware the Devil

by Captain Paul B. Rich
11th AAS, Scott AFB, Illinois

The crunch had been unmistakable—at least three runway lights were gone and there was also the damage to the right wing tip.

How could this have happened? The wind was only 300° at 2 knots, there were no clouds, visibility was unlimited and no other aircraft were in the pattern. Temperature was 98° F. We listen to Captain Humble's explanation.

"The ILS approach was a gimme. I could have flown it with my eyes closed. I had completed a good night's sleep and was ready to fly, yet here I was with a broken wing tip and several crunched runway lights. How could this have happened to yours truly, Captain I. M. Humble, world famous aviator and experienced hauler of all that's hauled?"

"Eleven years of experience behind the controls of these big babies and not as much as a scratch, up to now that is. Now, I have a bent bird, a questionable career and I still don't know what happened. It must have been the devil!"

Our friend, Captain Humble, had indeed encountered a devil but he never knew it. His nemesis was a dust devil—a little known, yet extremely hazardous weather phenomenon. Although the dust devil is not a new phenomenon, there isn't much scientific evidence gathered concerning its internal wind velocities, size, or force.

In 1959, the Glossary of Meteorology defined a dust devil as a "well-developed dust whirl; a small but vigorous whirlwind, usually of short duration, rendered visible by dust, sand, and debris picked up from the ground..." Little has changed in the 23 years since this was written.

While the average dust devil measures approximately 600 feet in height, with a diameter greater than 100 feet at the top, some have reached heights of several thousand feet. These dust devils also rotate cyclonically (counter-clockwise) and anticyclonically (clockwise) with equal occurrence.

Dust devils develop most often in dry regions on hot, calm afternoons with clear skies, when intense surface heating causes a very steep lapse rate of temperature in the lower few hundred feet of atmosphere. Thus, you have the origin for the strong convective currents and thermal destabilization associated with this hazard. The conditions described here were the exact same conditions in which Captain Humble flew his ill-fated approach.

Now that that we're done with the scientific hoopla, what exactly does all of this mean to us, the drivers of these magnificent flying machines.

"Oh," you say, "I've been bounced by thunderstorms and pelted by hail. I can handle a whimpy little whirlwind."

Depending on which side the dust devil is encountered and the intensity and direction of rotation, the resultant winds can either be headwinds, tailwinds, or both. Obviously, the size and speed of the aircraft will determine the effect on the flight path and altitude control. It also goes without saying that as the aircraft's wingspan increases, the effect

Honorable Mention, 1982 MAC Flying Safety Writing Contest

of the dust devil should decrease. However, this doesn't decrease their potential danger. There is yet another little-known hazard of the dust devil.

The winds that make up a dust devil can rotate at speeds up to 70 knots. Combine the rapid directional change with the upflowing and inflowing air and the wind shears possible can be rather dynamic. Not bad for a whimpy little whirlwind barely 600 feet high. Let's take our friend, Captain Humble, and his Starlifter. The airspeed was nailed right on the bug with the CDI and glide slope centered. As is true in all stories with a message, we're going to find this was the worst possible situation.

At 75 feet above the ground, the C-141 encountered a 300 foot tall dust devil with winds approaching 50 kts. The increased relative wind on the left wing (increased lift) and decreased relative wind on the right wing (decreased lift) resulted in an uncontrollable roll to the right. The right wing tip contacted several runway lights before the rate of descent could be arrested.

ABOUT THE AUTHOR

Captain Rich graduated from Wilmington College, Delaware, in 1974 and received his commission from the University of Maryland in 1977. He was an air traffic control officer at Shaw AFB, and subsequently served as deputy chief, then chief of air traffic control operations at Nellis AFB. Captain Rich entered pilot training in 1980 and received his wings at Williams AFB in 1981. He currently serves as a C-9 copilot at Scott AFB.

Another hazard of dust devils is they are not always visible. Like wake turbulence, dust devils travel slowly (less than 10 knots) across the ground. Also like wake turbulence, if the direction of travel is into a light surface wind, the dust devil will tend to hold its position in one location.

The added hazard comes when all the conditions are just right and the dust devil becomes stationary over a clean surface like a highway or runway. In spite of the name, visible particles don't have to be present for the development of a dust devil. This is why Captain Humble didn't notice anything and had no warning of the impending encounter.

A point of reality drives home the true seriousness of this danger. In June 1981, a T-38 solo-student at Williams AFB was rolling out after a full-stop landing. At approximately 20 knots below flying speed, the aircraft encountered an invisible dust devil 3,000 feet past the approach end of the runway.

According to on-duty RSU observers, the resulting winds tossed the T-38 10 to 12 feet into the air with 30° of right bank, and the nose of the aircraft rotated 5° to the right of runway heading. The T-38's airspeed indicator showed 119 knots—well below minimum flying speed—as the aircraft was being carried toward right-hand edge of the runway. A combination of a fast application of full afterburners and a large amount of luck prevented damage to the aircraft.

Judging from the effect of a dust devil on the small winged T-38, you can imagine the effect of a similar 50-knot change in relative wind on one of our large transport-type aircraft with their big wings and high-lift flaps.

This lesson can be concluded by stating three basic rules for encountering dust devils:

(1) Be alert for dust devils and be familiar with the conditions required for their development. You'll see them frequently on summer days in the southwestern United States.
(2) Avoid this weather phenomenom whenever possible.
(3) If an encounter is unavoidable, treat the situation as you treat an encounter with any wind shear. Proper control and power management are necessary.

Above all—BEWARE OF THE DEVIL. ★

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Current as of 1 May 1983

De Havilland

DHC-5 Buffalo

Statistics:
Length—79 ft (24.08 m)
Wing span—96 ft (29.26 m)
Height—28 ft 8 in (8.7 m)
Max T/O weight—49,000 lb (22,316 kg)
Max payload—13,843 lb (6,279 kg)
Max cruise speed—230 kts (420 km/h)
T/O run—1,050 ft
Landing run—610 ft

Cabin dimensions:
Length—31½ ft (9.58 m)
Width—8 ft 9 in (2.67 m)
Height—6 ft 10 in (2.08 m)
Volume—1,715 ft^3 (48.56 m^3)

In May 1962, the U.S. Army invited 25 companies to submit proposals for a new light STOL combat transport to replace/augment the service's piston-engine de Havilland C-7 Caribou. De Havilland Aircraft of Canada, Ltd., won the competition and designated the new airlifter "Caribou II." This was a logical name for the new transport since it was basically an enlarged, turboprop version of the firm's Caribou. Two years later, in April 1964, the first of these new light STOL transports flew under the designation DHC-5, but with the new name, "Buffalo."

One of the main features of the Buffalo is its cargo compartment which has the same dimensions as the CH-47 Chinook. This feature enables the Buffalo to carry everything the Chinook could haul including a 105mm howitzer, a Pershing missile or a 3/4-ton truck. In addition, the Buffalo can haul up to 41 fully-equipped troops or 35 paratroops. As with most tactical airlifters, the Buffalo possesses an excellent airdrop capability.

Power for the Army C-8A Buffalo, which is no longer in service, came from a pair of General Electric T-64-GE-10 turboprop engines rated at 2,850

equivalent shaft horsepower (eshp) driving three-bladed Hamilton-Standard props. The Canadian version of the Buffalo, the CC-115, is powered by the uprated CT64-820-1 rated at 3,055 eshp.

A rugged, reliable and simple airlifter, the Buffalo currently serves the forces of Canada, Ecuador, Brazil, Sudan, Togo and the United Arab Emirates. ✈

Reviewing the basics of instrument flying ...

Back to Basics

MAC 90027, approaching the glide path, wheels should be down. Do not acknowledge further transmissions...Begin descent...Slightly left of course, turn right heading 018...Going well below glide path, adjust rate of descent...MAC 90027, too low for safe approach, execute immediate missed approach. Contact approach control on 127.5."

Have you ever ended a PAR on this slightly embarrassing note? Well, hopefully not. How about someone with whom you were flying? Do you know why? Were you able to analyze what happened? The answer might be a lack of currency in the basic fundamentals of instrument flying.

Remember when you were in pilot training--those innumerable and thoroughly forgettable instrument rides? Think further back, back to that *first* instrument ride, the mission where your patient (temporarily, at least) IP demonstrated the basics of pitch, bank and power. Too basic you say? Not really! If you stop to think about it, all complex instrument procedures, like approaches, departures, holding patterns and the like, are comprised of a series of basic instrument maneuvers. Still not convinced? Then consider the fact that a PAR is nothing more than a combination of constant-airspeed rate descents and turns to headings. Aren't those some of the maneuvers you slaved through during your year as a "student pilot"? You bet they are! So, let's take a few minutes and review some basics of instrument flying—and I mean the *real* fundamentals.

All modern transport-type aircraft (i.e. those built in the past 30 years) have three types of instruments used by the pilots when flying instruments. First are the control instruments which display attitude and power indications and are calibrated to permit altitude and power adjustments in definite amounts. Obviously attitude indicators belong in this group, but so do the power

indicators which include tachometers, exhaust pressure ratio (EPR), manifold pressure, fuel flow, and torque indicators. Next are the performance instruments which indicate what the aircraft is actually doing. These include altimeters and airspeed/mach, vertical velocity, heading, angle of attack and turn and slip indicators. Finally, come the navigation instruments used to indicate the position of the aircraft in relation to a selected navigation facility or fix and include course, range (DME), glide slope, and bearing indicators. (Figure 1 provides a summary of these instrument categories.)

So much for the equipment, but how do we use it? That's right, I'm talking about those age-old rules called *instrument procedures*. Fortunately, there are really only four true-basic rules for instrument flying.

1. Establish an attitude or power setting on the control instruments which should give the desired performance. More simply, set the desired pitch or bank on the attitude indicator and put the power where you want it. Then,
2. Trim until the control pressures are neutralized. Next,
3. Crosscheck the performance instruments to see if what you set on the attitude and power instruments is providing the desired performance. Finally,
4. Adjust the attitude or power setting using the control instruments if a correction is necessary.

Now that we know the equipment and the procedures, let's take a look at just what we should be seeing on those instruments.

Pitch control, of course, is achieved by reference to the attitude indicator; by moving the airplane symbol up or down in relation to the level flight indication. But how far is "enough"? Many pilots would say "just pull the nose up a little—'till it feels right." But that is exactly, precisely *wrong*! We should move that airplane symbol to a definite spot on the attitude indicator. There's even a simple rule for figuring all this out.

In order to compute the correct pitch change to make in a specific situation, you need to know what each degree of pitch change will provide in change of vertical velocity. To quickly and accurately compute this, all you need to know is your indicated Mach number, which is converted to nautical miles per minute (NM/MIN) simply by multiplying the Mach number by ten. Let's say you are flying at 0.7 Mach and desire to climb using one degree of pitch change. What vertical velocity can you expect that one degree to provide? Complicated? Not at all. Just use the following formula:

VV=pitch change X NM/MIN X 100

VV—vertical velocity expressed in feet per minute

pitch change—expressed in number of degrees

NM/MIN—nautical miles per minute

Applying this to our hypothetical situation we get the following:

VV= 1 X 7 X 100

VV= 700 (FPM)

The result of all this mental gymnastics shows that at 0.7 Mach, a one degree pitch change will yield a vertical velocity change of 700 fpm.

This formula can also be used to compute the degrees of pitch change required to descend at at specific rate. The formula would then look like this:

$$\text{pitch change} = \frac{\text{VV}}{\text{NM/MIN X 100}}$$

Using a desired descent rate of 3,500 fpm and a speed of 0.7 Mach we get:

$$\text{pitch change} = \frac{3500}{700}$$

pitch change= 5 degrees

"Bank control? Piece of cake! I get a heading change, roll in some bank, then roll out when I get close to my heading." True,

that's the way many of us do it, but that's definitely *not* the way we were taught! Remember the blurb about knowing how much bank to use *before* you roll into a turn? It's still good advice.

As a guide when turning less than 30°, the bank angle should approximate the number of degrees you're going to turn. For turns of more than 30°, use 30° of bank or the bank angle indicated by the flight director (complying with flight manual restrictions, of course). Lead points for the rollout also need to be figured before they're reached, or more likely, passed. The lead point depends on the amount of bank used, the rate of turn and the rollout rate. A lead point of one third of the bank angle is a commonly used figure. As in many instrument maneuvers, this is an area that reflects your individual flying style. Just try to be smooth and consistent.

	Control	Performance	Navigation
Power Indicators	●		
Attitude Indicators	●		
Angle-of-Attack Indicators		●	
Airspeed and Mach Indicators		●	
Altimeters		●	
Turn-and-Slip Indicators		●	
Vertical Velocity Indicators		●	
Horizontal Situation Indicators		●	●
Radio Magnetic Indicators		●	●
Bearing-Distance-Heading Indicators		●	●
Course Indicators			●
Range Indicators			●

Figure 1. Instrument Categories

Power control is less precise because it depends on which instrument you use to set the power. Since different pilots use N-1, N-2, EPR, torque, fuel flow or other indications to set power, there can be no hard and fast rules other than the basic! Set the power to a known reference and see what it gives you. Then, if a correction is needed, make it small and precise. Many pilots have a series of approximate power settings memorized and use them to initially set the power in various situations. The point is, they always start with a specific power setting, then adjust from there.

There's one other area of basic instrument flying we need to cover and it involves lead points for leveling off from climbs or descents. The first suggestion is that when you are at least 1,000 feet above or below your desired altitude you should adjust the pitch to obtain a maximum of 1,000 to 2,000 fpm rate of climb or descent. Obviously, this may involve a power adjustment to maintain the desired airspeed. The pitch change for transitioning to level flight can be figured using our old friends the NM/MIN and the vertical velocity. Simply divide the vertical velocity by the NM/MIN X 100 and you get the pitch change needed to maintain level flight. As in our previous example, if we're descending at 3,500 fpm at .7 Mach, we'll have to make a pitch change of 5°.

Once you have figured the pitch change, select an appropriate lead point to initiate the final level off. A good guideline is 10 percent of the vertical velocity. When you reach your lead point above or below the desired altitude, smoothly transition to level flight and make an appropriate power adjustment.

Well, that's enough of the basics for now. But this discussion won't do any good if you don't practice the basics when you fly. Next time around the local pattern, try to figure and fly specific pitch attitudes, bank angles, power settings and lead points for both headings and altitudes. You'll be pleasantly suprised to find your instrument flying is more precise and much smoother when you get—"back to basics!"

A Matter of Currency

It was a beautiful day to go flying. The temperature was a balmy 86° and there was only a light wind out of the south at 6 knots. Not a cloud could be seen. The conditions were perfect to ferry an old Lockheed L-1049H Super Constellation, to Seattle, Washington, for some routine maintenance and an FAA inspection.

The qualifications of the flight crew appeared good, too. The aircraft commander was an experienced test pilot with over 17,000 total flying hours, including more than 2,000 in "Connies." On this flight, his son, seated in the left seat, would act as copilot. He, too, was an experienced commercial pilot who had accumulated over 8,000 hours, with between 50 and 100 of them in the L-1049. The engineer was an experienced commercial pilot with 20,000 total hours. He held an airframe and powerplant certificate, and a flight engineer certificate for reciprocating, turbojet and turboprop aircraft. Still, no one was sure how many of his hours were in the Super Constellation.

Mishap With A Moral

At 1339 local time, the copilot picked up the phone at the Columbus-Bakalar Airport at Columbus, Indiana, and called the Indianapolis Flight Service Station for a weather briefing. After that briefing, the copilot declined to file a flight plan stating that if one was needed, he would do it later in the air.

While the copilot was busy with the weather briefing, the rest of the crew was finishing the preflight of the vintage Lockheed, as well as loading the cargo and baggage. Once everything was loaded and tied down, everyone took their seats for the flight. The pilot-in-command was in the right seat, the copilot was in the left seat, and the flight engineer sat behind them. There were also five passengers including one of the company's owners.

All four engines on the "Connie" were started normally and the aircraft was taxied out to runway 22 where the crew conducted an engine runup. All engine readings were within limits, except for the number 2 engine. When the flight engineer checked the left magneto, he noticed a drop in the brake mean effective pressure (BMEP) of 100 psi. Knowing the normal drop in BMEP was only 7 or 8 psi, he ran the engine up to approximately 40 inches of mercury (inHg) manifold pressure and leaned the mixture to correct a suspected spark plug fouling problem. After this was done, the engine was checked to be operating normally.

With the engine runup complete, the crew taxied into position on runway 22 without accomplishing a crew briefing. The copilot advanced the throttles to between 38 and 40 inHg and told the flight engineer to assume control of the engines. This was standard procedure for takeoff. The flight engineer then advanced all four throttles for takeoff. In the L-1049H, normal takeoff settings for the engines are 57 inHg and 2,900 rpm when using high octane 115/145 aviation gasoline (avgas). Since this plane had been fueled with 100/130 octane avgas, however, lower takeoff power settings were to be used—51 inHg and 2,900 rpm. The maximum manifold pressure on any of the engine instruments observed by the passengers on board, though, was only 48 inHg.

As the aircraft began its takeoff run, witnesses observed white smoke coming from the number 2 engine. Photographs taken of the plane during that time confirmed this. Witnesses also noticed the nosewheel came off the ground momentarily between 4,000 and 4,200 feet down the runway. The nosewheel came off the ground again between 4,500 and 5,000 feet down the runway and the plane itself became airborne between 5,600 and 6,300 feet.

At almost the exact moment of liftoff, the fire warning light and alarm bell for zone number 1, number 2 engine activated. Some of the passengers later stated the engineer retarded the number 2 throttle which caused the light to extinguish and the alarm bell to cease. Coincidentally, these eyewitnesses also noticed the number 2 engine rpm was 1,700 and the manifold pressures of the other three engines indicated between 35 and 37 inHg. The engineer also stated, "I've got it." None of the observers saw or heard any sign from the pilot's station indicating either of the pilots had selected maximum power on the Connie's throttles. At 1359, N74CA crashed into a soybean field in a nose-high attitude, approximately 4,600 feet beyond the departure end of runway 22. The aircraft's wings broke off and the fuselage burst into flames as the Lockheed hit the ground. The Constellation continued through the soybean field and into a corn field, finally coming to rest in a small stand of trees.

Probable cause—the flightcrew's inadequate, uncoordinated response to the fire warning

The copilot in the left seat suffered only minor injuries. The right seat pilot and the flight engineer died as a result of traumatic injuries received when a small tree entered the cockpit causing the cockpit structure to collapse on the right side. One of the passengers died of smoke inhalation; the others suffered relatively minor injuries.

Analysis

Even though witnesses saw and heard warnings of a fire in the number 2 engine, NTSB investigators could find no physical evidence to confirm the fact. A heavy buildup of coke caused by a leak in the oil seal bellows in the number 2 power recovery turbine was deemed responsible for the thick, white smoke which was seen coming from the number 2 engine during takeoff roll. Since the oil was confined to the normal exhaust path, though, it could not have caused the fire.

Further examination of the engines and engine cowlings revealed the cowl flap actuator rods were extended only about 7 inches on numbers 1, 2 and 3 engines instead of the normal 8½ inches. According to Lockheed and other experienced Constellation flight crews, a fire warning on takeoff, without an actual fire, is not an uncommon occurrence. Such a fire warning is caused by an inadequate cooling airflow when the cowl flaps are not opened soon enough or far enough. Multiple or prolonged ground runups and high ambient temperatures, much like the events and conditions that existed on the day of the crash, contribute to the frequency of the fire warnings.

Next, the use of 100/130 avgas instead of the higher octane 115/145 avgas automatically reduced the maximum allowable gross weight for the Connie from 140,000 pounds to 120,000 pounds. This max gross weight for takeoff was further reduced to 117,840 pounds because of the high ambient temperature and elevation. From information extrapolated from the wreckage, fuel records and witnesses, the NTSB concluded the L-1049 weighed over 126,000 pounds—4 tons more than the allowable max gross weight for takeoff

Reviewing the records of the flight crew, the NTSB found all three were properly certified to fly the ferry mission and each crewmember held the proper medical certificates. Even though the pilot-in-command was very experienced, however, he had not flown in an L-1049 for a year and the copilot, his son, hadn't flown a Connie in over 4 years. Consequently, neither was current in the airplane. While it wasn't determined when the flight engineer had last flown the L-1049, his most recent experience was on a DC-8, a jetliner and not a reciprocating engine-driven plane.

Looking specifically at the actions of the flightcrew just prior to the emergency, witnesses stated the engineer had never advanced the throttles of the Connie to normal takeoff power for the reduced octane fuel. Failing to ensure normal power was set on the over-grossed Lockheed further reduced the chances of successfully surviving an emergency. Then, once the fire warning sounded, neither pilot advanced the Constellation's throttles to max power. In fact, the throttles stayed almost in the same position—below max power—from takeoff until impact!

Probable Cause

As a result of these and other findings, the NTSB determined the probable cause of the accident was the flightcrew's inadequate and uncoordinated response to the number 2 engine fire warning. As a result of their lack of currency in the L-1049, the pilot and the copilot also failed to correct a gradual power decay in the other engines. Further contributing to the crash was the aircraft's over maximum gross weight takeoff, the crew's use of less than full power for takeoff, and the improper setting of takeoff cowl flaps which prevented adequate cooling. Remember, too, the flightcrew never conducted a preflight briefing before taking the runway.

As you read this story, you are probably shocked to find the flightcrew's pronounced lack of currency in the aircraft they flew, even though all were supposedly experienced aviators. If you think this could never happen in the Air Force, think again. Though we continue to improve our methods of tracking currency requirements within our particular specialties, slip-ups can and do occur. As in this particular "Mishap with a Moral," the consequences are often swift and disastrous. Don't let it happen to you! Stay current and on top of your profession, or you and the rest of your crew might just become an AWTH—an accident waiting to happen! ✈

Adapted from NTSB AAR-80-145

Deja Vu

Osan Air Base, Korea

(elevation: 38 feet)

Located near the northwestern coast of South Korea, Osan Air Base is 28 miles south of Seoul. The nearest major airfields are Suwon, 9 miles north, and Hoengsong, 50 miles northeast. The highest point within 25 miles is a mountain, 2,133 feet MSL, located 20 miles north and the highest point within 10 miles is a hill, 1,148 feet MSL, 8 miles northwest. The emergency safe altitude within 100 nautical miles of Osan is 7,600 feet.

Osan Air Base has one runway, 09/27, 9,000 feet long and 150 feet wide. It's a precision runway with high intensity approach lights, a 1,000 foot overrun, jet barrier, three arresting gears, VASIs, and high intensity runway lights. Parallel taxiway and parking ramps are south of the runway.

Aircrews should be cautious at Osan due to extensive helicopter traffic. Unless otherwise cleared by ATC, aircraft departing under VMC conditions must remain *below* 700 feet MSL until past the airfield boundary to insure separation from the overhead traffic pattern.

Precision approaches to Osan include PAR and ILS for both runways. There are also NDB, tacan, VOR/DME, ASR and circling approaches available. During runway 09 operations, use extreme caution for aircraft operating in R-79 (the Koon-Ni gunnery range) located 14 miles west. If you spot any changes not in the airport qualification programs, please notify MAC AF/DOTs.

—Adapted from AQP 50556

At 1.5 miles, runway 27. Parallel taxiway and parking ramp are to the left.

On short final, runway 27.

At ½-mile, runway 09.

C.R. TERROR

Shopping Techniques of the Bargain Basement Buffoon

Button it up, m'crew. We've only got 2 hours and 15 minutes ground time here at Kimsanda AB, which is just enough time to do some serious shopping and still refile, check the notams, and get a weather update," debriefed C.R. Terror, Consumer Extraordinare, intent on adding to his world famous collection of tennis shoes, jogging suits, and "Non-Members Only" custom summer jackets.

"Well, don't forget about checking in with command post and the air freight terminal," chirped in his able right-seater Sammy, finishing the engine shutdown checklist alone.

"Of course, a stop at the exclusive BX flight line snack bar for some nachos with rice, sauerkraut-covered mongolian beef, diced onions, and a side order of oriental chili-con-carnage is in order," added Blinky, intent on forever extinguishing the crew's grease-low-level light.

"Transient alert will be gassing us up to the tune of 25,000 pounds," interjected Sergeant Max Torque, trying to jog the Flatulent Flyboy's memory of aircraft commander responsibilities.

"We've got a thru-load of three pallets and four pax, Boss. ATOC said earlier they've got some priority mail and four emergency leaves for us," continued Sergeant Ty Downs, as the last piece of MICAP was carried off the Herk. With skill honed by years in the MAC system, the Capable Quartet completed C.R.'s Before-Browsing checklist and Best Bargain briefing.

"All right, m'lads. All right!" gasped the Addled Aviator, his 50-knot brain oversaturated with Mach-1 information. "You know my rules, be back in the seats 30 minutes prior to our scheduled 1740 local takeoff."

Quickly changing into civilian clothes, C.R. and his crew grabbed a commercial taxi and proceeded directly, via the flight line snack bar's

"to go" line, to the small shopping village located just outside the main gates of the base.

"Max, you're my only hope for this shopping foray, you're the last one available," coaxed the Silver-tongued Fox trying to get the engineer to help carry his small mountain of bulky packages. "I've still got to pick up 12 custom-tailored, double-knit leisure suits for my 1983 social season and, of course, some assorted trinkets for Tassels."

"Be glad to help you, Boss. But it'll cost you 2,400 benagies," explained Sergeant Torque, computing the local currency.

"Time's awastin'!" exclaimed the Pudgy Pilot pressing on. "You've got yourself a deal."

At 1710, C.R. and Max were still at Kareful Kim's Tailor Shop, where the Rotund One had just completed another of his famous bulk purchases. "I'll be back next month to pick up the Nehru jackets, Kim. Thanks for the tip about 'em comin' back in style." Visions of being on the "10 best-dressed men" list flashed in front of him.

"Boss, I think you're running a little late," pleaded Sergeant Torque for the third time in the last 20 minutes as he crushed his digital watch in exasperation. "We need to get back."

"Nonsense, Max. We sent Sammy, Blinky, and Ty back 30 minutes ago and they'll have the plane ready to go," C.R. blustered while leisurely perusing some multi-colored silk beads and eel skin wallets. Casually he glanced at his robot-made, solar-celled, fusion-proof, Meiko chronometer and 23-hour clock.

"Gadzooks, Max!" the Ace of Airlift yelped. "Look at the time! You should've warned me. We'll have to hustle now."

"I *did* warn you, Boss! Three times, I warned you!" Max replied, gritting his teeth in utter exasperation and sporting a strange gleam in his eye. If looks could kill, C.R. was a dead man.

"And so you did, and so you did," replied the Procrastinating Pilot quickly changing the subject. Hailing a taxi, the Flailing Flyboy, crammed himself and three pallet positions of packages in back, leaving Max to squeeze in beside the driver. At the Bargain Basement Buffoon's urging, they made a terrifying dash back to their C-130, arriving with only 15 minutes remaining until scheduled takeoff time.

Screeching to a halt at the tactical trash hauler, C.R. barked commands in panic, "Sergeant Torque, start the APU, fire the torpedoes, man the turrets, anchors aweigh." Sammy, sitting in the right seat, strapped in and ready to go, just moaned resignedly, silently pondering the impending crew delay.

C.R., intermittently aware of their perilous time situation, continued, "Let's imitate a train and make tracks." His attempt at humor was ignored by his crew who were busily completing the required checklists.

"Speaking of tracks, Boss, you've still got your running shoes on as well as your personal wardrobe," Blinky jibed as he finished studying his navigation chart for departure.

"Right you are, Blinky. Merely testing your AFR 35-10 knowledge. Can't afford to let our crew appearance standards slip, ya' know," retorted the Portly Pilot pulling his flight suit over his civilian attire and adjusting his imitation silk, purple polka dot scarf.

Ty Downs, meanwhile, briefed all the passengers waiting on the pax service bus while the remainder of the crew completed last-second preparations for flight.

"I've still got an exterior walkaround to do, Boss!" growled Sergeant Torque, still miffed at the Malingering Major and his buying spree.

"Complete, engineer. Performed the scan myself, and all looks normal to me," answered C.R. "I really don't know why you engineers take so long to walk around the plane. Why I completed the chore in less than a minute."

Moments later and with passengers aboard, the Hurtling Herk was performing a combat taxi at 12 minutes past scheduled departure time. "Two more minutes and we'll have ourselves a delay, troops, and I don't think we can hang this one on ATC, although it might be worth a try," groaned C.R., preparing a back-up plan of action.

Giving a shorter than normal takeoff briefing, C.R. continued his race with the clock, "SOP! I drive, you feather. Any questions, crew?"

"I've got a couple of questions," Blinky mentioned.

"Forget it nav, we'll answer them airborne," scolded C.R., beads of sweat breaking out on his ample brow.

"Tower, Sloe 21, we've got a controlled departure time of 12 minutes ago. We're an active Air Evac, and we need *immediate* priority handling," called the Ace of Alibis.

"Sloe 21, we don't have you down as an Air Evac. Sorry about that. You're cleared for immediate takeoff ahead of the two Eagles," the innocent, young tower operator replied.

"Hey, Boss. I didn't know we're an Air Evac," questioned Sergeant Downs.

"I'll brief you later, load," C.R. replied scowling. "Thanks, tower. You may have just saved us, er...our patient from heart failure," added C.R. honestly, his heart throbbing in his throat.

"On the roll, Sammy," directed the Ace of Aerospace as he threw the power levers over the gate and almost through the stops. The brown-and-green flying machine roared down the tarmac gathering speed rapidly.

"Reject!!" cried out Sammy, Max and Blinky simultaneously. "No airspeed."

C.R. cast an unfriendly glance out of the corner of his eye. "Not to worry, lads," refuted the Magnificent Major continuing the takeoff roll. "Probably only a temporary loss."

Airborne, C.R. called the tower. "Log us off at 1754 local, and thanks for the help."

The courteous tower operator replied, "Sloe 21, *official* tower time shows you off at 56. Sorry you're late, but better luck next time."

Before the Worrisome Warrior could ponder the late takeoff, his attention was jogged to the present by his competent second-in-command.

"Boss, we need to declare an emergency for no airspeed indication. Let's set up an orbit for a join-up with another aircraft. I've got command post on the line asking if we need a conference skyhook," briefed Long Sufferin' Sam, handling yet another Terrorific flight in stride.

"Boss, did you remember to take the pitot covers off on your walkaround?" Sergeant Torque asked suspiciously.

C.R. slumped in his seat and sighed resignedly as his head began to pound in time with the Hamilton-Standard props. "You take this one, Sammy. I've got a little headache coming on."

"Not to worry, Boss. Not to worry," replied Sammy, not quite believing his own words. "I'm sure we'll have plenty of time in crew rest for you to recover." ★

Quick Stoppers

Got a Light?

Quick thinking by an HH-53 flight engineer flight examiner and his trainee recently prevented the possible loss of their aircraft. They were on a normal night training mission and had completed two uneventful flare drop patterns using LUU-2/A flares. Prior to the third drop, the flight examiner set up the next two flares' lanyards and preset the flares from "safe" to "500 feet". Just before the helicopter turned final for the drop, the engineers heard a dull thud, looked down and saw the number 2 flare had inadvertently popped the timer knob and dial assembly, exposing the spring and part of the flare's parachute. In the dim light of the helicopter, they were unable to locate the timer knob, so they tossed the flare outside the aircraft. The flare ignited just as it passed below the right-hand sponson. Good decision!

Which Way is Really Up?

It's night—you're in the soup—and you're flying the aircraft as precisely as you can. So it comes as a real shock when the flight examiner (They're everywhere! They're everywhere!) in the right seat makes a comment about your erratic bank control. Sound like a potential Q-3? Well, not in a recent case involving a C-130A. It seems the crew was enroute to a nearby AFB for some night shortfield landing practice. The pilot was flying the aircraft when the flight examiner (occupying the right seat) noticed the left seater's bank control was erratic. A quick crosscheck of the attitude indicators showed the pilot's attitude indicator had failed in the roll axis with the pitch axis still functioning normally. The failure went undetected because there was no indication it had happened—no warning flags—nothing! Luckily this crew noticed the problem, the pilot transferred control of the aircraft and the flight examiner made the landing from the right seat. It's still not a bad idea to compare attitude indicators periodically, and to include altitude, airspeed and heading indicators in your check as well.

Problems, Problems!

The HH-53 had just passed through 5,000 feet when one of the flight engineers, riding in the rear cabin, reported hearing a high frequency vibration. The aircraft commander immediately started a return to the base and initiated a descent. Enroute to the field, the pilot briefed a run-on landing and reviewed procedures to be used should an immediate landing be required. No emergency was declared at this time, and the crew contacted the tower and were cleared to enter an extended right base.

Approximately 1 mile before the HH-53 was to turn final, the tower called the crew and instructed them to turn downwind due to conflicting traffic. As the helicopter's AC initiated a left turn to enter downwind, he depressed the left pedal microswitch to coordinate the turn. But the aircraft immediately entered a *hard* left turn, causing full displacement of the ball in the turn-slip indicator. The pilot then depressed the right pedal to center the ball, but encountered binding in the pedal movement which required abnormally high pedal pressure. He immediately declared an emergency with tower, turned final and was cleared for landing. Following a normal run-on landing, the aircraft was taxied clear of the runway and shut down.

Maintenance found a bad impeller bearing on the oil cooler transition duct which caused the original high frequency vibration. Futher investigation revealed a failed component in the autopilot, leading to the yaw problem. Both parts were replaced and corrected the simultaneous but unrelated problems. Moral: if something doesn't seem right, it probably isn't. Then it's best to land and let the maintainers take a look.

Ultra-light, Ultra-close!

A West Coast C-141 crew was being vectored to a non-precision final when they experienced a near miss with an ultra-light aircraft. The Starlifter crew, level at 4,000 feet, first noticed the white ultra-light as it appeared at their 12 o'clock position. The C-141 AC took abrupt evasive action in the form of a descending right turn and managed to avoid a collision with the open-air aviator. According to the MAC crew, the ultra-light passed slightly above and to the left of their aircraft, at a distance of approximately 200 feet. Due to a lack of radar or radio contact with the miniature aircraft, there was no way to identify either the pilot or the craft. The sight of a C-141 streaking by within 200 feet should've left a *very* vivid impression on the ultra-light's pilot.

The Yolk's on Me!

The C-130 had just lifted off from a sunny Florida base bound for the snowy wastelands of the North. After an uneventful level off at FL 250, the crew busied themselves checking out the always excellent inflight lunches prepared by the departure station's inflight kitchen. The copilot inspected his hard-boiled egg, then tapped it on the throttle quadrant. As he did, he felt a thick fluid oozing through his fingers. Since another crewmember did a great chicken imitation, there was some doubt as to the origin of the obviously never-boiled egg. After a thorough investigation and a quick cleanup, the blame was placed with the inflight kitchen. No harm done, but the potential was there.

Good thing the copilot didn't order the chicken snack!

The "Low-on-Gas" Pass

The Sabreliner mission was planned with a 500 pound pad in the fuel figures to a destination requiring an alternate. This pad quickly disappeared as the miniliner encountered adverse winds enroute. The "disappearing fuel" problem was compounded when ATC descended the CT-39 to 12,000 feet some 100 miles from the landing field.

Arriving at the destination, the Sabreliner got an extended approach due to traffic in the area. At this time the crew advised approach that they would like a shortened approach and were "about 5 minutes from emergency fuel." Advised they were number 2 to land behind a C-130, the crew replied, "Okay." In the meantime tower cleared a C-9 for takeoff between the C-130 and the CT-39, expecting the C-9 to takeoff from the intersection. The Nightingale, however, chose to back taxi, and the Sabreliner had to go-around. After a closed pattern, the miniliner landed with less than emergency fuel.

Why did the CT-39 almost run out of gas? In addition to the problems just discussed, the Sabreliner pilot *never* declared minimum or emergency fuel. When it became apparent that lack of fuel was a problem, the crew should have told someone—declared minimum or emergency fuel, if necessary. Doing so would have ensured that approach control and tower talked to each other and the possibility of a go-around might have been avoided!

375 AAW *Sabrelines*

Notable Quote

Experience provides the ability to recognize that you are making the same mistake you made before.

-Author Unknown.

After Deadlines

PARDON OUR OMISSION—Back in March when we listed the winners of the annual MAC Flying Safety Achievement Awards, we inadvertently overlooked one of the winners of that award. As the old saying goes, "better late than never," and we gladly take this opportunity to recognize another winner of that award. From *TMF*, congratulations to the 314th TAW, Little Rock AFB, on winning this prestigious award

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NEW LOOK FOR *TMF*—As you peruse this issue of *The MAC Flyer*, you'll undoubtedly notice some changes to the logo, the table of contents and the overall layout. Our redesign of *TMF*, the first in over 13 years, was done to bring the layout of the magazine up to date, make it more appealing and more readable. The changes resulted from months of study, planning, discussion and experimentation, and were timed to give the magazine a new look as we head for its 30th anniversary next year. We're excited about the changes, and proud of the magazine's role in promoting flight safety around the world. As always, we'd like to hear your comments, not just about the redesign, but on any safety-related topic. Write us or call AV 638-3534.

AWTH REPORTS GET ACTION—In last month's *TMF*, we ran an AWTH report concerning the landing-illusion problem at Alexander Hamilton Airport, St. Croix, Virgin Islands. The publication of the report generated enough interest that a recommended change to the IFR Enroute Supplement identifying this hazard will be forwarded to DMAAC in St. Louis. AWTH reports get action, if you take the time to write them. Keep 'em coming!

GIVE US YOUR PICTURES, YOUR ARTICLES—That's right, *TMF* is looking for factual technical, non-fiction articles all the time, as well as pictures of MAC air operations. Non-fiction articles should fit into our three-page format, including illustrations, which comes out to about 6 or 7 type-written, double-spaced pages. The subjects for an article might range from tried-and-true instrument flying pointers or tactical airdrop techniques, to loadmaster and flight engineer-related subjects, to med-tech articles and the like. The one rule for all articles in *TMF* is that they contain some safety message. We are also looking for pictures of MAC in action. Pictures should be black and white, though we can use color, and should depict air and ground operations in all kinds of weather. Pictures submitted to *The MAC Flyer* will become the property of *TMF*, but we will give a credit line to the photographer.

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The Berlin Airlift

OPERATION VITTLES—A Douglas C-54 passes over the heads of some of the more than 2,000,000 beleaguered West Berliners to land at Tempelhof Air Base with life-sustaining supplies during the Berlin Airlift. Flights started on 26 June 1948, and ended on 30 September 1949.